Poultry Mortality
Composting

March 2002

Alberta
AGRICULTURE, FOOD AND
RURAL DEVELOPMENT

Agdex 450/29-1

Prepared by:
Livestock Engineering Unit
Agricultural Engineering Branch
Alberta Agriculture, Food and Rural Development

Published by:
Information Packaging Centre
Alberta Agriculture, Food and Rural Development
7000 - 113 Street, Edmonton, Alberta
Canada T6H 5T6

Copyright © 2002.
Her Majesty the Queen in Right of Alberta
(Alberta Agriculture, Food and Rural Development).
All rights reserved.

102-05501/

Poultry Mortality Composting

Contents

Chapter 1	
Mortality Composting Principles	**1**
Chapter 2	
Planning Considerations	**5**
Chapter 3	
Poultry Mortality Composter Design	**8**
Chapter 4	
Compost Production Management	**11**
Appendix A	
Acts and Regulations	**13**
References	**14**

Chapter 1 MORTALITY COMPOSTING PRINCIPLES

Introduction

Mortalities are a fact of life for commercial livestock producers. Livestock and poultry die from disease, accidents and competition. Under Alberta's *Destruction and Disposal of Dead Animals Regulation* of the *Livestock Diseases Act* (see **Appendix A**), the owner of a dead animal shall dispose of the animal within 48 hours of its death. Today, animal agriculture is challenged to discover innovative ways to dispose of livestock and poultry mortality. This need has been brought on by the limited accessibility of rendering plants, concerns over burial and groundwater pollution, the economic cost and other issues related to incineration, and by the large volume of deads from larger livestock operations. Composting of livestock mortalities is one option that is now available. There are two general approaches to livestock mortality composting: enclosed or bin systems, and open pile systems. Alberta regulations allow either option for livestock composting. This section provides an overview of the principles of composting and management practices for composting animal mortalities.

Basics of Composting

Composting is a natural biological process of decomposition of organic materials in a predominantly aerobic (presence of air) environment. During this process, bacteria, fungi, and other micro-organisms break down organic materials into a stable mixture called compost, while consuming oxygen and releasing heat, water, and carbon dioxide (CO_2). The finished compost resembles humus and can be used as a soil amendment. Composting reduces the volume of the parent materials, and pathogens are destroyed if the process is controlled properly.

Micro-organisms involved in composting can be classified according to temperatures most favourable to their metabolism and growth. The mesophilic 10 - 43°C (50 - 110°F) and thermophilic micro-organism 43 - 71°C (110 - 160°F) are the principal groups. A simplified view of the composting process is presented in ***Figure 1.***

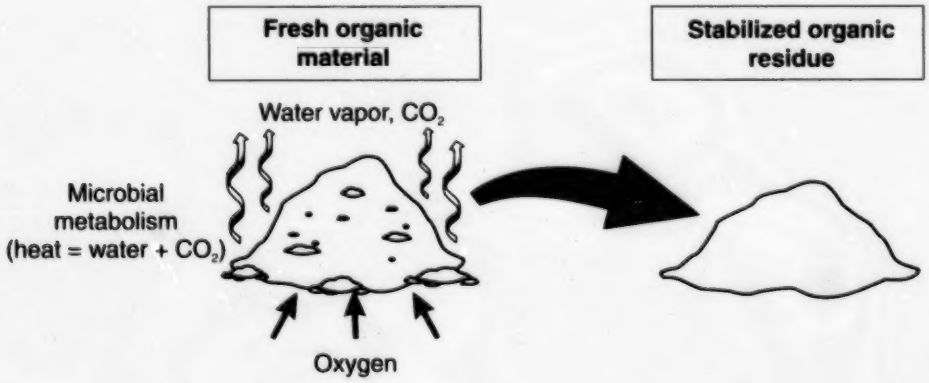


Figure 1. Composting process.

Under controlled conditions, composting is accomplished in two main stages: a composting stage and a curing stage (see ***Figure 2***). The composting stage involves three sub-stages:

- An initial stage (lasting one to three days) when mesophilic micro-organisms degrade constituents such as sugars, starch, and proteins and compost temperatures rise rapidly.
- A high rate thermophilic stage (lasting 10 to 100 days) in which temperatures rise above 41°C (110°F) and fats, hemicellulose, cellulose and some lignins are degraded and pathogens are destroyed.
- A stabilization stage (lasting 10 to100 days) during which time the temperature declines and further degradation of cellulose, hemicellulose and lignins occurs.

The high-rate stage is accomplished through a high rate of oxygen uptake and carbon dioxide (CO_2) output. Ammonia (NH_3) and other gases may be released if the process is not controlled well. During curing or maturation, mesophilic organisms recolonize the compost. The length of curing time depends on market opportunities but typically represents a minimum of one month and generally lasts three to six months.

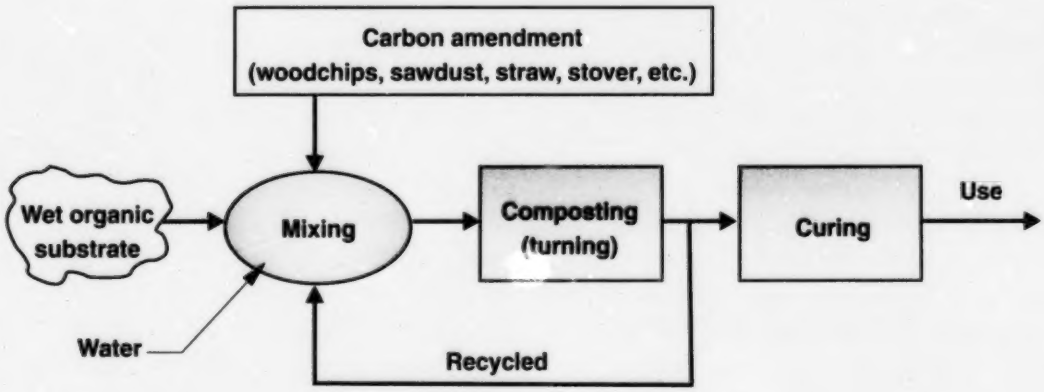


Figure 2. Material flow for the conventional composting process.

Factors Affecting Composting

While composting is a natural process, it requires proper conditions to occur rapidly, minimize odour generation, and prevent nuisance problems. Over twenty controllable factors affect composting. **Table 1** lists eight of these factors and acceptable ranges to aim for when composting. Four major factors to be controlled in the composting process are the material mix (nutrient balance), water content, porosity, and temperature.

Material Mix (C:N)

The proper compost mix requires both carbon and nitrogen at the proper C:N ratio. This will result in a composting process that generates little odour, yet offers an environment where micro-organisms can flourish. Generally, an initial C:N ratio ranging from 20:1 to 40:1 is satisfactory. Most compostable materials have a C:N ratio that is too low to compost properly on their own. In order to compost these materials, amendments that contain a

high C:N ratio must be added. Plant materials such as wood chips, sawdust, chopped corn stover, shredded paper, or straw have a high C:N ratio for on-farm composting.

Water Content and Porosity

Like all living things, micro-organisms need water. To encourage their growth and rapid composting, water content of the mixture should be 50 - 60% (wet basis). It is important to avoid excess water due to the potential for odour and leachate conditions. If the mixture feels moist, yet no water drips from it when a handful is squeezed, the mixture probably has adequate water content.

Micro-organisms that are encouraged to grow in a compost pile are aerobic, or require oxygen. Open spaces (porosity) must be maintained to allow air to penetrate and move through the pile providing oxygen. Ideally, 35 - 45% of the pile volume should be small, open spaces. Optimum porosity is achieved by balancing the material's particle sizes, water content of the mix, and pile size.

Temperature

The composting process will generate and regulate its own temperature. However, to maintain high temperatures the pile must be large or have some insulation. A layer of inactive material, sawdust, or finished compost placed over the entire pile will insulate the pile. As the pile heats up, warm air within the mixture will rise and move out of the pile, while fresh air will be drawn in to replace it. This process exhausts the CO_2 created in the pile and maintains an aerobic environment for the micro-organisms.

The highest rates of decomposition occur for temperatures in the range of 43 - 66°C (110 - 150°F). Also, high temperatures above 55°C (131°F) over three days will kill parasites, and fecal and plant pathogens within the pile. At temperatures above 66°C (150°F), microbial activity declines rapidly with activity approaching low values as compost temperature exceeds 71°C (160°F).

Table 1. Guidelines for composting: major factors.

Major Factors	Reasonable Range	Preferred Range
Nutrient Balance (C:N ratio)	20:1 - 40:1	30:1 - 35:1
Water Content	45 - 65% w.b.	50 - 60% w.b.
Particle Size	0.8 - 1.2 cm (1/8 - 1/2")	Depends on Material
Porosity	30 - 50%	35 - 45%
Bulk Density	< 640 kg/m^3 (1100 lb/yd^3)	
pH	5.8 - 9.0	6.5 - 8.0
Oxygen Concentration	> 5%	> 10%
Temperature	45 - 68°C (113 - 155°F)	54 - 66°C (130 - 150°F)

Livestock Mortality Composting

Composting livestock mortality almost always moves toward satisfying the principles previously mentioned. Unfortunately, strict application of these standards should only be done when dealing with a consistent, thoroughly mixed pile. The reality is that a pile in which livestock mortality is composted is an inconsistent mixture. Therefore, composting livestock mortality must be approached in a slightly different way.

Figure 3 illustrates the process followed for composting animal mortality. The compost pile (either open or in a bin) is an inconsistent mixture. It is composed of a large mass of material (the animal) with a low C:N ratio, a high moisture content, and nearly zero porosity surrounded by a material (the carbon amendment) with a high C:N ratio, moderate moisture levels, and good porosity. The animal and amendments are layered into the pile, and no mixing is done until after the high-rate stage of composting has occurred and the animal has fully decomposed. Composting livestock mortalities (primary stage) can best be described as "*above ground burial in a bio-mass filter with pathogen kill by high temperature.*"

The decomposition process is anaerobic (lacking oxygen) in and around the animal mortality, but as gases are produced and diffused away from the mortality, they enter an aerobic zone. Here the gases are trapped in the surrounding material, ingested by the micro-organisms, and degraded to CO_2 and H_2O. The surrounding material supports bacteria to form a biological filter, or a biofilter.

With this scenario, avoid turning the pile until the mortality has been decomposed. For moderately sized animals (poultry, pigs, sheep, etc.) this is generally less than three months after the last mortality has been placed into the pile. After this time, the pile is moved to a secondary area where it is allowed to compost for an additional 10 days to several months. This procedure introduces air back into the pile and mixes the contents, leading to more uniformity in the finished compost. The secondary pile is then turned and placed in a pile for storage for 30 days or more. When composting large, mature animals, bones sometimes remain intact after completion of the secondary/storage process. They are generally quite brittle and pose no health risks or danger to equipment when land applied. In some instances, it may be desirable to recycle the larger bones back into the compost to allow for more decomposition.

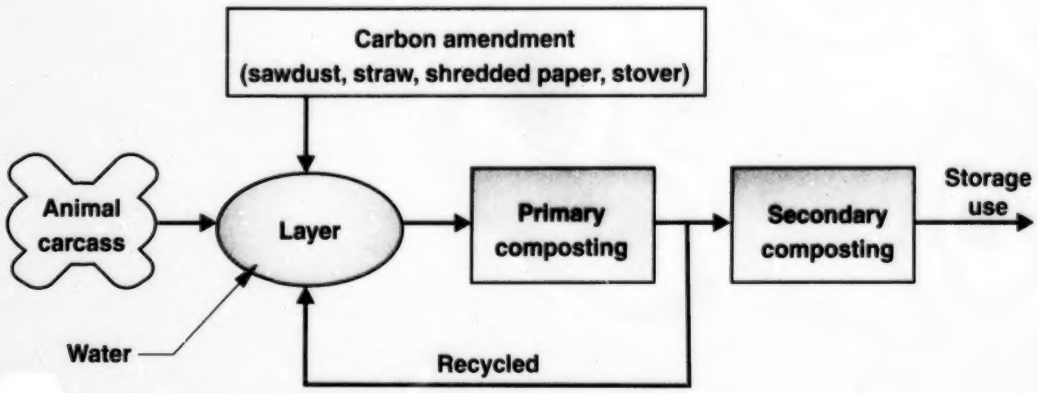


Figure 3. Material flow in livestock mortality composting.

Chapter 2 PLANNING CONSIDERATIONS

Construction

Actual construction of a composter can be of many different forms, all producing good results. Some essential features to consider are location, type of structure, construction materials, and ingredient storage. All good composters will include some or all of the following characteristics.

Location/Access

Location of a composter should follow the criteria in Section 2, subsection (4)(d)(ii) of the *Destruction and Disposal of Dead Animals (A.R. 229/2000)* of the *Livestock Diseases Act.* It states that the compost pile be:

- at least 100 metres from wells or other domestic water intakes, streams, creeks, ponds, springs, and high water marks of lakes and at least 25 metres from the edge of a coulee, major cut or embankment,
- at least 100 metres from any residences,
- at least 100 metres from any livestock facilities, including pastures, situated on land owned or leased by another person,

The location should also take into account any impact it may have on the farm residence and any nearby neighbouring residences. While offensive odours are not usually generated in the composting process, the handling of dead birds, manure, and litter on a daily basis may not be aesthetically pleasing. When locating a composter consideration should be given to traffic patterns required for moving dead birds, the required ingredients, and removing the finished compost from the composter. The composter site should be well-drained and provide all-weather access roads and work areas.

Foundation/Floor

An impervious, weight-bearing foundation and floor should be provided for all primary and secondary composting areas. This feature ensures all-weather operation, helps secure the composter against rodent access, and generally minimizes the potential for contamination of the surrounding area. In addition to providing concrete under the compost bins, consideration should also be given to providing a similar concrete floor in traffic areas and work alleys. Experience has shown that, with the frequent loading and unloading activities associated with composting, dirt or even gravel areas tend to become rutted and potholed. This condition worsens if the work alleys are not roofed.

Construction Materials

Any portion of the composter structure such as poles and sidewalls that will be in contact with dirt or composting material should be constructed with pressure treated lumber or other rot-resistant materials.

Roof

A roof covering the primary and secondary composting bins is required to control rainwater and the moisture content of the composting mass. Roofing the working area also facilitates all-weather activities. Additionally, any ingredient storage areas or bins should be roofed to preserve the ingredients at the desired moisture content. Roof heights must be adequate to ensure clearance for front-end loaders. However, a high roof may allow too much direct rain or water draining off the roof to be blown into the composter. This problem can be minimized by adding partial sidewalls and roof gutters.

Ingredient Storage
Having sufficient amounts of ingredients such as sawdust and litter present at the composter site greatly facilitate the day-to-day management of the process. However, litter may only be readily available during periods of partial or total building cleanout. Inclement weather can also hamper the handling and transfer of ingredients in a timely fashion. In determining the amount of storage needed, consideration should be given to the frequency with which ingredient transfer and restocking can be managed. Storage requirements may vary considerably among different operations. It has been suggested that providing a minimum of two bins (of primary bin size) for ingredient storage will sufficiently facilitate the operation of a four primary bin composter. If more than four primary bins are required, ingredient storage may need to be increased according to the above ratio. Bins used for storage can double as primary composting bins (e.g., during periods of high death loss) or they may facilitate the expansion of the composter if the farm is increased. Ingredient storage does not have to be in bins but the ingredient storage area should be roofed.

If the composter can be constructed in conjunction with a litter storage facility, ingredient handling may be greatly simplified. Litter will be readily available from the litter storage area and other ingredients can be stored appropriately in the same location.

Finished Compost Storage
Secondary compost bins provide a place for compost to undergo a second heating cycle and further composting. However, as secondary bins become full the compost must either be spread on the land or moved to a finished compost storage area. Any compost storage area should be covered to prevent rainfall from saturating the pile which could cause leaching. A litter storage facility can also be used to store finished compost until land spreading can be conveniently carried out.

Utilities
A water line with a freeze-proof hydrant at the composting facility will aid in adjusting the moisture content of the recipe (if needed) and further facilitate cleanup and washdown of personnel, equipment, and the composting area. A minimum 20-amp electrical circuit will allow for the use of power tools, lights, or other appliances that may be required at the compost facility.

Sizing the Composter

In sizing a poultry composter, it is necessary to know, or estimate, the number and weight of birds in the enterprise, and the expected percentage of daily mortalities (see **Table 2**). Maximum daily mortality (on a weight basis) usually occurs when birds are at or near market weight. Once the maximum daily mortality weight is known the number and size of composters can be calculated.

Bin systems constructed for composting poultry typically consist of bins having a total volume of 125 L/kg (2 ft^3/lb) average daily loss. Of this, 62 L/kg (1 ft^3/lb) is required for both primary and secondary composting. For example, a broiler farm averaging 100 kilograms of loss per day would need approximately 6.2 m^3 (219 ft^3) of primary bin capacity and the same amount of secondary bin space. If half or more of the birds to be composted are large (7 kg or more), increase total bin volume by 50% to 190 L/kg (3 ft^3/lb) average daily loss.

Table 2. Typical poultry mortality.

Poultry Type	Average Cycle Mortality (%)	Cycle Length (days)	Average Daily Mortality (birds/1000 birds)	Maximum Bird Weight		Daily Mortality Weight (per 1000 birds)	
				kgs	lbs	kgs	lbs
Broiler Breeders							
Females	12	294	0.41	3.6	8.0	1.5	3.3
Males (@ 10% of flock)	17	294	0.058	5.2	11.5	0.3	0.67
Broilers	5	40	1.25	1.9	4.2	2.4	5.3
Roasters	7	56	1.25	3.6	8.0	4.5	10.0
Layer Breeders							
Females	11	294	0.37	1.8	4.0	0.7	1.5
Males (@ 10% of flock)	16	294	0.054	2.6	5.8	0.14	0.31
Commercial Layers	8	365	0.22	1.8	4.0	0.4	0.9
Pullets							
Broiler Breeders	6	140	0.43	2.1	4.6	0.9	2.0
Layers	4	140	0.29	1.3	2.9	0.4	0.8
Broiler Turkeys	5.5	787	0.71	5.4	11.9	3.8	8.4
Heavy Turkey Hens	7.5	92	0.82	7.5	16.5	6.1	13.5
Heavy Turkey Toms	12.5	114	1.10	12.2	26.9	13.4	29.6

Chapter 3 POULTRY MORTALITY COMPOSTER DESIGN

The design and layout of the composter can be determined once an estimate of the primary and secondary composting volumes have been calculated. The layout of a composter should be flexible. This will accommodate existing features, restrictions, traffic patterns, equipment or other factors particular to a given operation. No specific layout is necessary or best in all cases. The following points should be taken into consideration when designing a mortality composter.

1. Provide primary and secondary composting volumes as previously calculated.

2. Depth of compost bins should not exceed 1.8 m (6 ft). This will reduce compaction effects and the potential for spontaneous combustion. An ideal bin depth is 1.5 m (5 ft).

3. Since small carcasses are usually placed inside the primary composting bins by hand, the front of the bin should be designed so that carcasses will not have to be lifted over a five foot high door. This can be accomplished with removable dropboards that slide into a vertical channel on each side of the bin, or with doors that split horizontally.

4. The width of compost bins is usually selected to accommodate the loading/unloading equipment to be used. Tractor front-end loaders or skid-steer loaders are typically used to load and unload bins. Bin width should be at least 300 mm (12 in), and preferably 0.6 - 1 m (2 - 3 ft) wider than the bucket used for unloading, in order to prevent excessive mechanical damage to the bin or loader. If wheels on the loading/unloading equipment are wider than the bucket, the bin should be widened accordingly.

5. The length of compost bins is generally 1.5 m (5 ft) for poultry. Longer bins are more difficult to enter and exit. Composting proceeds more efficiently if the composting mass lies in a square configuration, rather than in a long rectangular bin.

6. Several smaller primary composting bins work more efficiently than a few very large bins.

7. Even though calculations may indicate fewer, a minimum of two primary bins is required. This allows use of the second bin while the top layers of the first bin are still composting.

8. Secondary composting volume may be provided in bins that are duplicates of the primary bins, or may be provided in one bin equal to the total required secondary volume.

9. It may be desirable to add one or two extra primary composting bins in a composter design. These bins can be used to store ingredients such as litter, sawdust, etc. If unusually high mortalities occur during some period, the extra bins could be put into service to compost the extra mortalities. Experience has shown that some ingredient storage at the composter site greatly facilitates management of the process.

While some producers find that they can manage with less capacity, the extra space is inexpensive. It provides valuable operating flexibility for contingencies such as short periods of higher than average mortality, busy times of the year when bins cannot be emptied on schedule, or occasional batches requiring additional time to decompose completely.

Total bin volume recommendations suggested here are based on average daily death losses. Catastrophic losses due to disease, ventilation failures, or other unpredictable events would require considerably larger facilities.

The number of bins required for a composting system depends upon the individual bin dimensions and the total required bin volume. Bins with up to 7 - 8 m^3 (250 - 300 ft^3) of capacity are recommended for small carcasses. These bins have a floor area of approximately 5 m^2 (50 ft^2). Extremely large bins that take a long time to fill are undesirable as they lead to unnecessarily long heating times since the first carcasses were placed.

Example 1 illustrates the method for determining the number of primary bins needed for a poultry mortality composting system. Since fractional sized bins cannot be used, the calculations suggest that three primary bins be provided. Two bins might be adequate some of the time but the estimated primary composting volume may be inadequate during periods of high death loss. Three or four bins provide additional room for ingredient storage, with excess composting volume available in the event of a farm expansion or higher than expected death loss. Primary bins may be arranged in any configuration suitable to the operator. Generally, it is more efficient to arrange the bins so that primary composting can be quickly and easily moved to the secondary composting area.

Example 1

How many primary compost bins are needed for mortalities from a chicken broiler operation that has an average daily death loss of 160 kg (350 lb)?

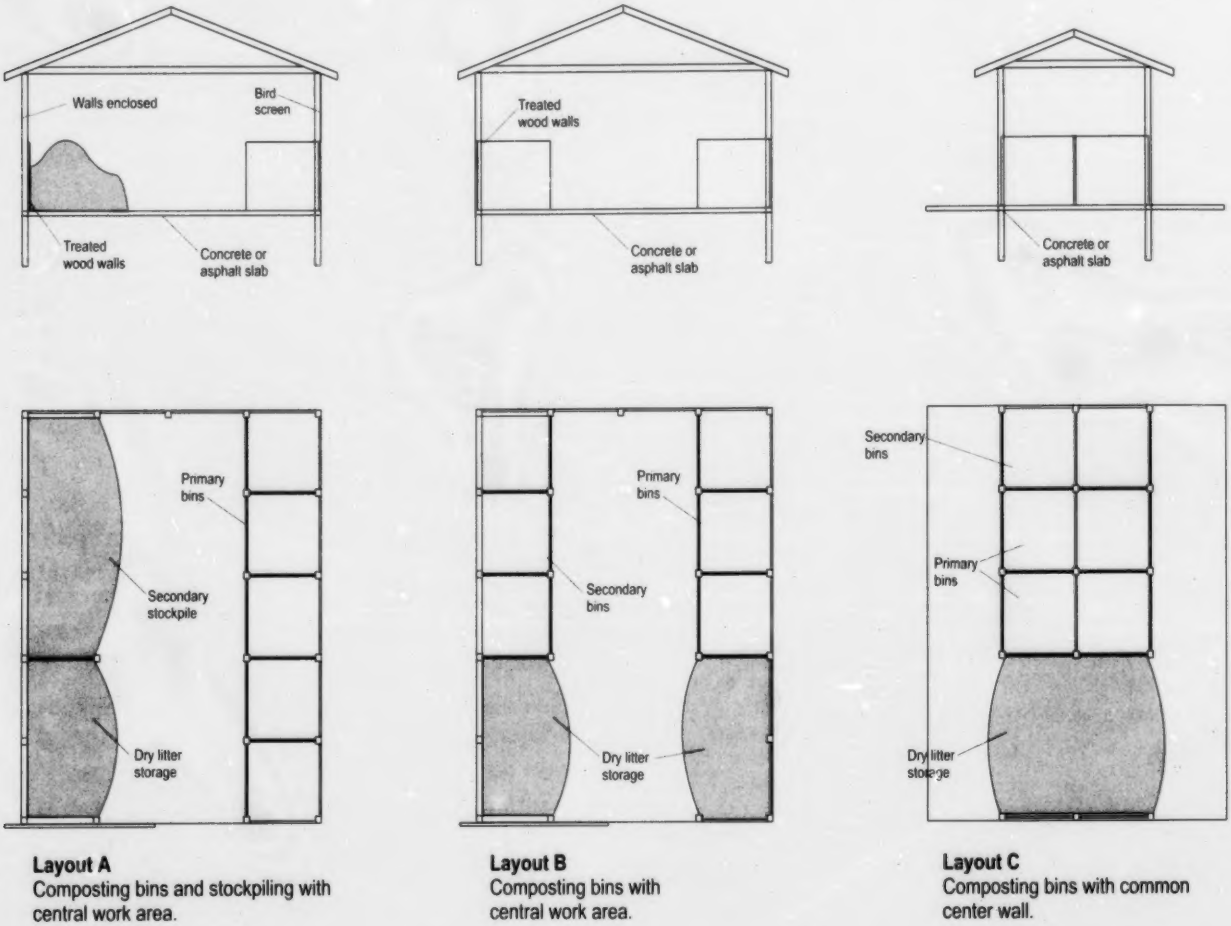
1. Calculate the primary composting volume.
   160 kg x 62 litres/kg = 9920 litres ÷ 1000 = 9.92 m^3 (or 350 lbs x 1 ft^3/lb = 350 ft^3)
2. Determine the primary bin depth.
   Recommended: 1.5 m (5 ft)
3. Determine the primary bin width.
   Recommended: Bucket width + (0.6 - 1 m) (2 - 3 ft) For example, if bucket is 1.2 m (4 ft) wide then bin width should be about 1.9 m (6 ft).
4. Determine primary bin length.
   Recommended: 1.5 m (5 ft)
5. Determine bin volume
   (length x width x depth).
   1.5 m x 1.9 m x 1.5 m = 4.28 m^3
   (or 5 ft x 6 ft x 5 ft = 150 ft^3)
6. Determine the number of primary bins required.
   (total primary volume ÷ primary bin volume)
   9.92 m^3 ÷ 4.28 m^3 per bin = 2.32 bins
   (or 350 ft^3 ÷ 150 ft^3 per bin = 2.33 bins)
   Note: round up to 3.

Figure 4 - Layout A is a schematic of a composter layout using five primary bins and a large floor area for stockpiling the secondary compost. It also includes space for dry litter. This building can be enclosed on three sides (one end door) and the wall above the primary bins can be screened. These added features improve visual aesthetics, reduce odours, and restrict bird access for better disease control.

Figure 4 - Layout B is a schematic of a composter layout using three primary bins, with secondary composting volume provided in bins opposite the primary bins. A litter/ingredient storage area is provided at one end of the unit to facilitate management of the system.

Figure 4 - Layout C is a schematic of a composter integrated within a litter storage unit. In this system, litter is available as needed from the litter

storage area. This area also provides long-term storage for finished compost and litter not used in the composting process. As environmental concerns increase, the need for a litter storage facility is likely to become more acute. Litter spreading (including finished compost) should be done when climatic conditions and crop nutrient needs are most favorable to minimize environmental impacts.



Layout A
Composting bins and stockpiling with central work area.

Layout B
Composting bins with central work area.

Layout C
Composting bins with common center wall.

Figure 4. Three typical composting unit layouts.

Chapter 4 COMPOST PRODUCTION MANAGEMENT

Poultry composting can be accomplished by placing a 300 mm (12 in) layer of dry poultry litter in the bottom of a bin as shown in ***Figure 5***. When carcasses release excess moisture, this absorptive base layer helps prevent the release of highly odorous leachate.

Carcasses are placed on top of the base layer at least 230 mm (9 in) away from bin walls. Placement closer than this can lead to liquid seeping through the walls. Keeping carcasses away from sidewalls also helps to maintain them at temperatures that speed decay and kill disease-causing micro-organisms. Carcasses should not touch each other; too many carcasses in one spot lead to localized wet spots and poor composting.

After the carcasses are positioned inside the bin, they are covered with 150 mm (6 in) of poultry litter. Incomplete coverage can lead to fly problems.

Layering of carcasses and poultry litter continues until the bin is filled to a depth of about 1.2 m (4 ft) and then capped with 300 mm (12 in) of dry poultry litter. In a properly operating compost operation, new material added to the bins reach temperatures of 50 - 65°C (122 - 149°F) within 24 to 48 hours.

If dry poultry litter is not available, a mix (by weight) of one part caged layer manure with 0.2 parts straw or sawdust can be used as a substitute.

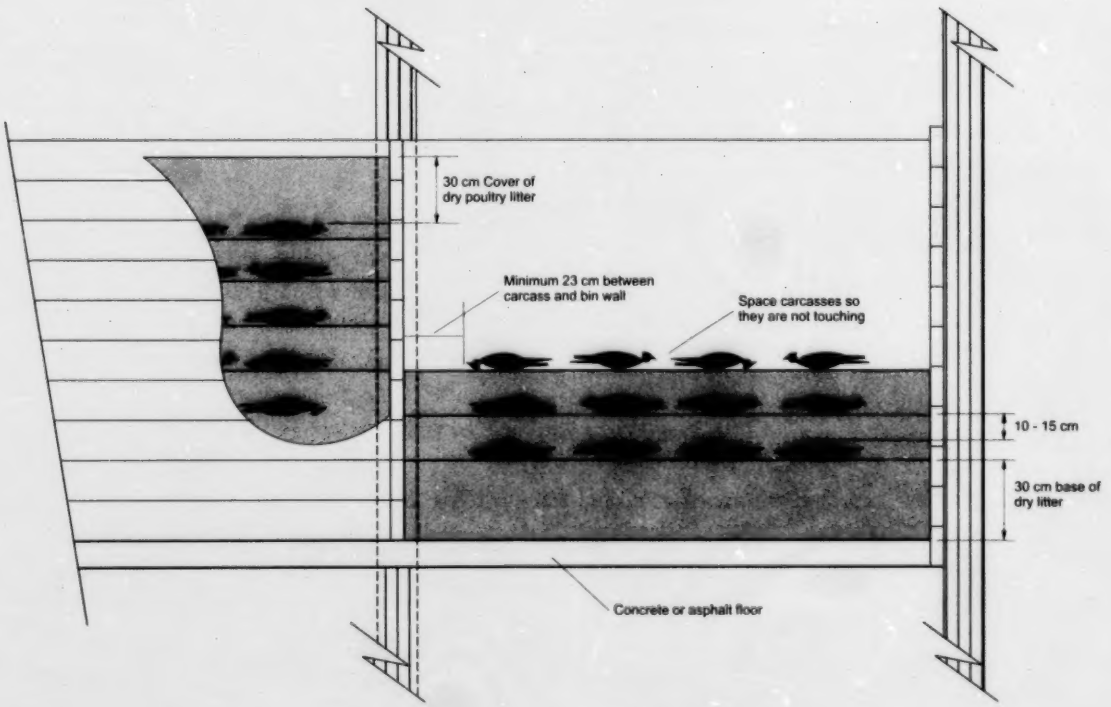

30 cm Cover of dry poultry litter
Minimum 23 cm between carcass and bin wall
Space carcasses so they are not touching
10 - 15 cm
30 cm base of dry litter
Concrete or asphalt floor

Figure 5. Composting bins are loaded in layers.

Two Stage Process

After a bin is completely filled, it must undergo primary heating that lasts 10 to 14 days. During this time, rapid microbial action depletes the oxygen within the bin, the rate of decay slows, and temperatures may begin to fall. The total length of this first stage should typically take 3 to 4 weeks.

Following the first stage, the partially composted waste is removed from the primary bin and placed into a secondary bin. The mechanical action of moving the compost breaks up the pile, redistributes excess moisture and introduces a new oxygen supply. Once this takes place a secondary heating cycle occurs, accompanied by further decomposition.

By the end of the secondary heating stage (generally another 3 to 4 weeks), carcasses as large as 7 - 9 kg (15 - 20 lb) are normally reduced to a few brittle bone fragments that are clean and free of tissues that cause odours and attract insects and predators.

Large birds weighing 7 kg (15 lb) or more may need a third heating stage to achieve complete decay, particularly if compost moisture content falls outside the optimal 50 - 60% range. If large birds constitute a major portion of daily flock losses, it is advantageous to compost large and small carcasses separately. This minimizes the amount of bin space tied up in a third heating cycle that is not required for small carcasses.

Monitoring the Composter

Temperature is a good indicator of the "health" of the compost process. A probe-type dial thermometer with a 1 m (39 in) stem is a good instrument for monitoring temperatures in bins. Temperature should be checked daily to determine the condition of the compost. Normally, temperatures in the primary bins should rise to 55 - 65°C (131 - 149°F) in one or two days, and peak at 60 - 70°C (140 - 158°F) within 7 to 10 days. Temperature is an important parameter in the control of fly larvae, pathogens and weed seeds. Temperatures over 44°C (111°F) will destroy fly larvae and temperatures over 53°C (127°F) will destroy bacteria. Weed seeds are destroyed at temperatures over 60°C (140°F).

Although experience indicates that temperatures above 75°C (167°F) are rare, a remote possibility exists that temperatures could rise to spontaneous combustion levels. If temperatures appear to be rising towards the 75°C (167°F) level at a constant or increasing rate, the compost should be removed from the bin and spread on the ground to cool.

Appendix A ACTS AND REGULATIONS

Livestock Diseases Act: Destruction and Disposal of Dead Animals

Method of Disposal

2 (1) The owner of a dead animal shall dispose of the animal within 48 hours of its death in accordance with this section.

(2) When an animal is known or suspected to have died from an infectious disease that can be spread by scavengers or insects or from a reportable disease, the owner of the animal shall dispose of in it in accordance with the directions of an inspector appointed under the Health of Animals Act (Canada) or a veterinary inspector appointed under the Livestock Diseases Act, but in no case may the animal be disposed of by natural disposal.

(3) The owner of a dead animal that has been euthanised with drugs or other chemical substances shall immediately take steps to prevent scavengers from gaining access to the dead animal between the time the animal is euthanised and the final disposal of the animal.

(4) Subject to subsection (2), the owner of a dead animal shall dispose of it by:

(d) composting

(i) in a Class I compost facility as defined in the Waste Control Regulation (AR 192/96) that is designed, constructed and operated in accordance with sections 6 and 7 of the Code of Practice for Compost Facilities, published by the Department of the Environment, or

(ii) subject to subsection (5), in a farm open compost pile that is:

(A) located at least 100 metres from wells or other domestic water intakes, streams, creeks, ponds, springs and highwater marks of lakes and at least 25 metres from the edge of a coulee, major cut or embankment,

(B) located at least 100 metres from any residences,

(C) designed in a manner that will exclude scavengers, and

(D) at least 100 metres from any livestock facilities, including pastures, situated on land owned or leased by another person,

(5) Where under subsection (4)(d)(ii) animals are to be composted in a farm open compost pile,

(a) each animal or part of it must not exceed 100 kilograms,

(b) the maximum volume of the animals or parts of them must not exceed 25% of the total compost pile, and

(c) the animals or parts of them must be covered by at least 15 cm of composting material.

References

B.C. Agricultural Composting Handbook
Second Edition, 2nd printing, September, 1998.
Ministry of Agriculture and Food

Composting Livestock Mortalities
Ontario Ministry of Agriculture and Food and Rural Affairs, 1997.

Composting: A Method of Dead Animal Composting in Minnesota
Minnesota Department of Agriculture

Keener, Harold and Elwell, David *Mortality Composting Principles and Operation*
Ohio State University Extension

Murphy, Dennis and Carr, Lewis *Composting Dead Birds*
Universtiy of Maryland